

What is the Manufacturing Sector?



2 HOURS

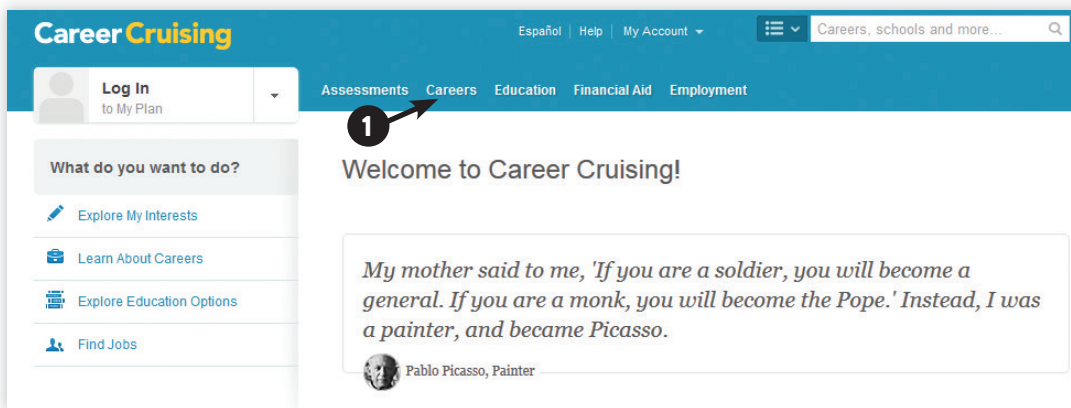
Students read a description of the Manufacturing sector overall, then summarize its main points, choosing from a variety of summary formats.



Determine central idea

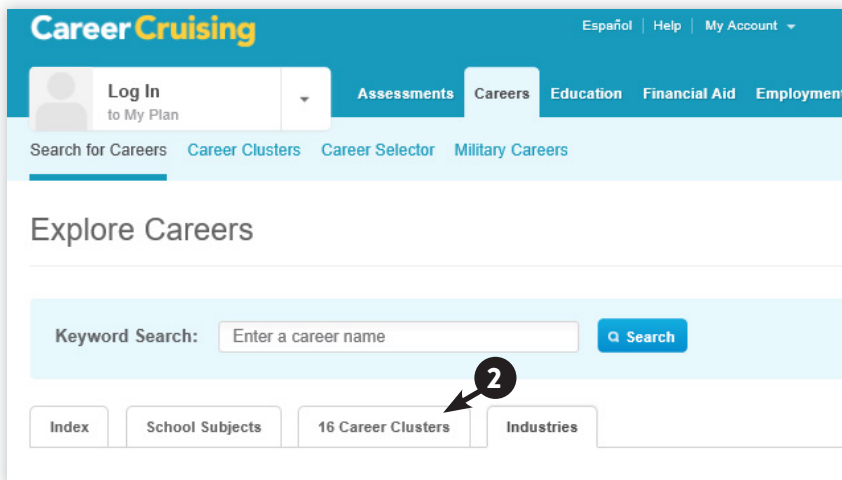
PREP

- Read *Manufacturing Sector Profile*
- Navigate to **careercruising.com**. The Career Cruising website requires a subscription username and password. If your program does not subscribe to careercruising, use the CareerZone website. Once in Career Cruising, navigate to the **Careers** section. This is a resource for the teacher to learn background information about the Manufacturing sector.



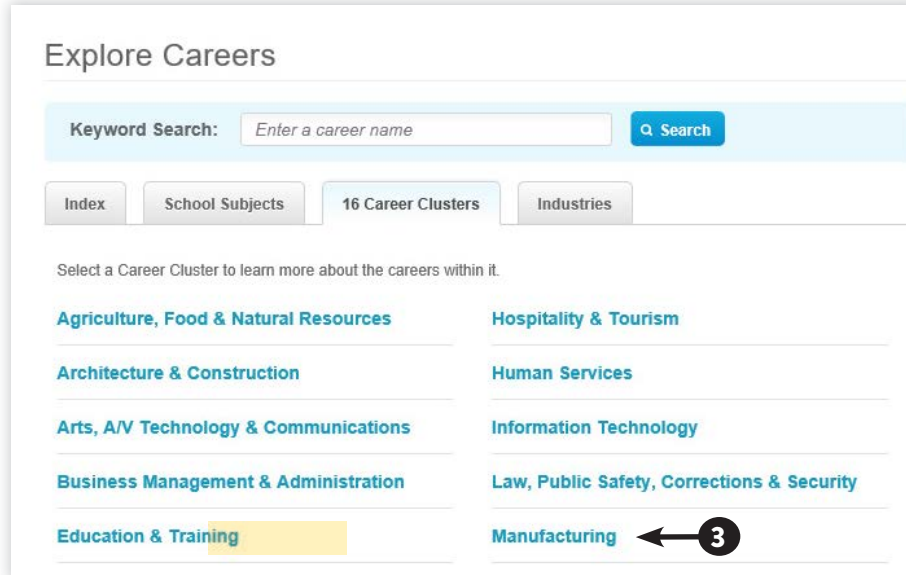
The screenshot shows the Career Cruising website. The top navigation bar includes links for 'Assessments', 'Careers', 'Education', 'Financial Aid', and 'Employment'. The 'Careers' link is highlighted with a circled '1' and an arrow. Below the navigation bar, there is a search bar and a 'Log In to My Plan' button. The main content area features a 'Welcome to Career Cruising!' message and a quote by Pablo Picasso: 'My mother said to me, 'If you are a soldier, you will become a general. If you are a monk, you will become the Pope.' Instead, I was a painter, and became Picasso.'

Next click on **16 Career Clusters**.



The screenshot shows the 'Explore Careers' page on Career Cruising. The top navigation bar includes links for 'Assessments', 'Careers', 'Education', 'Financial Aid', and 'Employment'. Below the navigation bar, there is a search bar and a 'Log In to My Plan' button. The main content area features a 'Keyword Search' field and a 'Search' button. Below the search bar, there are four tabs: 'Index', 'School Subjects', '16 Career Clusters', and 'Industries'. The '16 Career Clusters' tab is highlighted with a circled '2' and an arrow.

Lastly, navigate to **Manufacturing** and read about the Manufacturing Sector.



MATERIALS

- *Manufacturing Sector Profile*
- Chart paper, markers and post-it notes

DISCUSS

- 1 When you think of jobs in Manufacturing, what jobs do you think of?
 - › *Assembly line workers, welders, engineers, designers, product testers, machinists.*
- 2 Where do people in Manufacturing work?
 - › *Large factories, small businesses, government agencies, and anywhere that items are produced and maintained.*
- 3 Are all jobs that work with machines part of the Manufacturing sector? For example, are sonographers (people who operate sonogram machines) part of the Manufacturing sector?
 - › *No, because the Manufacturing sector exists to produce items, using a combination of machines and human labor. Many sectors use machines, to serve the public. The Manufacturing sector uses machines to create products.*
- 4 Manufacturing interacts with many other industries. Although Food Production can be considered part of this sector, for our discussion, we will focus only on non-food items.

EXPLAIN

- 1 We're going to learn a lot about working in the Manufacturing sector and about various jobs and career pathways. Let's begin with thinking about which careers and employment settings are included in the Manufacturing sector. Distribute *Manufacturing Sector Profile*.
- 2 Ask students to read the article, then turn to a partner and identify the main ideas of the article.
 - › *Manufacturing jobs include a variety of tasks, such as designing products, assembling products, programming machines to cut parts, maintaining machines, and doing quality control to make sure that the products are well-designed and well-made.*
- 3 Ask students to read the article a second time, explaining that when they are finished reading, they will write a summary of the article without looking at it. Ask students to explain what a summary is and discuss any confusions.

A summary is a brief explanation of the main points. It does not include a lot of details and uses the summarizer's own words.
- 4 Ask students to put the article away and write a 3-5 sentence summary of the article.
- 5 Ask for a few volunteers to read their summaries aloud.
- 6 Divide the students into six groups and assign each group one of profile sections.
- 7 Distribute chart paper and markers to each group. Each group should create a short summary about their section. It may be in the style of a traditional summary, bullet point list, word cloud, FAQ, comic, or other visual representation.
- 8 Post the chart paper on the walls and have students do a "gallery walk", where they walk in their groups to read all other summaries. At each summary, they first read, then write on their post-its what they wonder based on what they have read, and place them on the summary. Once everyone has visited each summary, tell each group to take their own group's summary along with the post it comments, back to their seats.
- 9 Ask each group to read the post-it annotations on their chart papers and to discuss them in their groups.
- 10 Have one representative from each group share their responses to the post-it comments with the rest of the class.

Manufacturing Sector Profile

1. What is Manufacturing?

Establishments that work in Manufacturing convert raw materials or parts into finished goods. For example, a paper mill turns wood from trees or recycled materials into paper. A garment manufacturer turns fabric into clothing. Some manufacturers make parts for other manufacturers to use. For example, one manufacturer may make the parts another business needs to assemble an airplane or a computer.

Manufacturers make products in different ways, for example, some make items by hand, others produce items using the latest technology and/or produce large amounts of standardized products using an assembly line. Establishments in this sector use these techniques to make a wide range of products such as apparel (clothes), computers and electronic equipment, aluminum, glass, concrete, tractors and televisions.

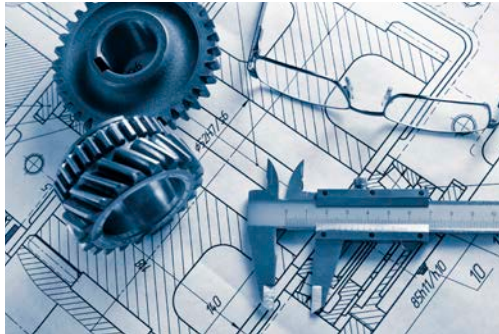


Image: <http://www.nabasoft.com/wp-content/uploads/2016/04/Manufacturing-MABlogImage.jpg>

2. The History of Manufacturing in New York State

For much of its history, New York State was a powerhouse of Manufacturing activity. New York City was its largest Manufacturing center, particularly known for apparel Manufacturing in the 'garment district', a neighborhood that is still known for fashion and design. Manufacturing jobs were also a source of economic prosperity for upstate communities that hosted large Manufacturing plants, such as Kodak and Xerox in Rochester, General Motors and the auto industry in Buffalo, and General Electric in Schenectady and Utica. Cities such as Binghamton, Elmira, Syracuse, and the Albany-Troy-Rensselaer area produced everything from shoes to aircraft simulators and automobile parts.

During the last 50 years, Manufacturing employment in New York State has steadily declined. Between 2000 and 2010, the number of jobs in Manufacturing in the State fell from 752,300 to 457,800. More recently, between December 2015 and December 2016, the sector lost 9,900 jobs. Despite these losses, Manufacturing still represents about 5% of total employment in New York State and is a significant industry in some regions. For example, the Capital Region gained 3,000 Manufacturing jobs between 2009 and 2014. These new jobs were concentrated in chemical Manufacturing, fabricated metal product Manufacturing, machinery Manufacturing, and computer and electronic product Manufacturing. Across



the State there are efforts to revive Manufacturing and parts of the industry are expected to grow between now and 2024.

3. Who Works in the Manufacturing Sector?

The average age of workers in Manufacturing in New York State is 47 years old. This is older than the average age of all workers across all industries in the state, which is 42 years old. As these workers begin to retire and exit the workforce, new workers will be needed to take their places. Many of the jobs that will become available as these retirees leave the sector will be in the skilled trades. Examples of jobs in the skilled trades are welders, electricians and machinists. Some skilled trade jobs pay well above New York State's overall median annual wage and many do not require more than a high school degree or equivalent. People who work in the skilled trades often go through apprenticeships and receive on-the-job training.

4. Technology's Impact on Manufacturing

Employers in this sector are increasingly using high-tech production processes to make their work more efficient and precise. Manufacturers need fewer workers in today's technologically advanced factories than they did in the past because automation is replacing workers. The workers they hire need more advanced technical skills than those who worked in the industry previously. Manufacturing workers use technology at work to do tasks such as collecting, organizing and analyzing data; creating products or parts of products; managing production processes; keeping track of the hours people work; communicating with colleagues; and scheduling their appointments. Basic computer skills are needed for most jobs in the industry.

5. Outsourcing Abroad

Some manufacturers have moved their production facilities abroad or contract with companies in other countries to manufacture parts or products. In general, the cost of labor and raw materials is cheaper in these countries. Manufacturing abroad can save manufacturers money, but it reduces the number of jobs in the United States. Because Manufacturing has become so automated, some experts say that manufacturing products in the United States is becoming cheaper, so some companies are starting to do work in the U. S. that they used to do abroad.

6. Jobs in Manufacturing

Five very common occupations in Manufacturing in New York State are:

1. **Team Assemblers**—work as part of a team that assembles finished products or finished parts. Their responsibilities may include: performing quality checks on the items they assemble; preparing finished products for shipment;

cleaning work areas; and reviewing work orders to make sure everything has been done properly. They typically need a high school diploma or equivalent. In 2016, there were 38,400 team assemblers across New York State earning an average annual salary of \$31,080.

- 2. First-Line Supervisors of Production and Operating Workers**—supervise and coordinate the activities of production and operating workers, such as team assemblers. Their responsibilities may include: making sure safety and sanitation rules are being followed; coordinating the work employees; planning with other supervisors; setting work schedules and assignments to meet production goals; and inspecting materials, products, or equipment to detect defects. These supervisors typically need a high school diploma or equivalent. In 2016, across New York State, there were 25,650 Manufacturing first line supervisors and they earned an average annual salary of \$65,860.
- 3. Inspectors, Testers, Sorters, Samplers, and Weighers**—inspect, test, sort, sample, or weigh raw materials, parts or products to see if they are damaged. Their responsibilities may include measuring the dimensions of a product to make sure they are correct; reading manuals and other materials; recording data; and determining which products are acceptable and which should be rejected. They typically have a high school diploma or equivalent. In 2016, across New York State, there were 20,681 of them and they earned an average annual salary of \$41,650.
- 4. Machinists**—set up and operate a variety of machines to produce specific metal parts, instruments and tools. Their responsibilities may include calculating dimensions; securing tools, accessories, or materials onto machines; measuring, examining, or testing completed products to check for defects. Machinists typically need a high school diploma or equivalent. In 2016, across New York State, there were 13,480 machinists and they earned an average annual salary of \$44,460.
- 5. Sales Representatives**—sell products to businesses or groups of individuals. Their responsibilities include contacting existing and potential customers to tell them about the products they are selling; recommending products to customers, based on the customers' needs and interests; estimating prices and delivery dates; and following up with customers after they have purchased a product to resolve problems and to provide support. Sales representatives typically have a high school diploma or equivalent. In 2016, across New York State, there were 89,800 Manufacturing sales representatives and they earned an average annual salary of \$72,640.

The specific titles and responsibility of these jobs are likely to vary by employer. All five occupations are expected to grow between now and 2024. •